

# NARCOTIC EDUCATIONAL FOUNDATION OF AMERICA

Drug Abuse Education Provider of the:

California Narcotic Officers' Association

## DESIGNER DRUGS: THE ANALOG GAME

### QUICK FACTS:

The term "designer drugs" was originally coined in the laboratory of Dr. Gary Henderson at the University of California at Davis. It was originally meant to refer to the increasing sophistication of chemists in illicit laboratories who are able to produce drugs designed to fit the tastes of individual clients. Designer drugs are beginning to play a more prominent role in the drug marketplace. The aim of these chemists is to manufacture compounds that produce the "high" or euphoria of controlled substances (such as narcotics, depressants, stimulants, or hallucinogens), but that are chemically different and thus are not subject to the provisions of the Controlled Substances Act. By selling these chemical variants (analogues), the clandestine manufacturer can profit from the distribution of dangerous compounds that can be abused, while avoiding the penalties that would be levied against those illegally trafficking a controlled substance. GHB in the United States was placed on Schedule I of the [Controlled Substances Act](#) in March 2000. However, when sold as [Xyrem](#), it is considered Schedule III, one of several drugs that are listed in multiple schedules.

### HISTORY OF DRUG

The term "designer drugs" was originally coined in the laboratory of Dr. Gary Henderson at the University of California at Davis. It was originally meant to refer to the increasing sophistication of chemists in illicit laboratories who are able to produce drugs designed to fit the tastes of individual clients. The use of chemical analogs for the purpose of avoiding the laws regulating controlled substances was first noticed in the 1960's with the synthesis and sale of the amphetamine analogs of mescaline.

The concept of designing pharmacologically active, chemically related substances referred to as analogs, is neither new nor restricted to clandestine laboratories. In fact, many controlled substance analogs were not designed by clandestine chemists, but are substances that were developed by legitimate pharmaceutical chemists and published in the scientific literature. In the quest for better medicinal agents, pharmaceutical companies will synthesize and test numerous analogs of a parent compound. Example, 1-Phenyl Cyclohexyl Piperidine (PCP) was developed by Parke Davis Pharmaceutical Company along with at least 34 other analogs which were published in the open literature.

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### DESIGNER DRUGS ARE DRUGS OF CHOICE

- 1 Economic and social costs must be considered an important part of all discussions regarding synthetic drugs, especially because of drugs which can cause neurodegenerative diseases.
- 2 The training needs for law enforcement, and the treatment network, must be addressed immediately. Without appropriate training these institutions cannot mitigate this emerging problem.
- 3 The domestic production of new, potent, synthetic drugs will be the major drug abuse problem in the future. As efforts to control natural products become more successful, there will be more incentive to illicitly synthesize drugs.
- 4 New synthetic drugs will appear which will be more potent and more selective in their action.
- 5 Smoking and "snorting" these drugs (routes of administration difficult to detect) will become more popular.
- 6 The low risk of detection will stimulate their use in populations such as prisoners, parolees, and military personnel.

### History *(continued from column 1 - this page)*

Several of these analogs were produced in clandestine laboratories. Many of the analogs mimic the qualitative actions of the original compound, but may vary in potency (the dose required to produce maximal effects) and/or duration of action.

Designer drugs are beginning to play a more prominent role in the drug addicts' marketplace. Such drugs as fentanyl analogs are being sold as "China White" or "Synthetic Heroin," etc., and are being asked for by addicts on the street. Availability and price are attractive to the user. Some users feel the designer drugs may contain less adulterants than the parent illicit drug.

### SIDE EFFECTS & TOXICITY OF DESIGNER DRUGS

- ◆ Respiratory depression is the most significant acute toxic effect of the designer drugs.
- ◆ Bradycardia - Some of the designer drugs decrease the heart rate up to 25% with a parallel drop in blood pressure of up to 20%.
- ◆ Addiction liability - Many of the designer drugs produce both tolerance and physiologic dependence following repeated administration.

## SYNTHETIC NARCOTICS FENTANYLS

### HISTORY OF DRUG:

The fentanyl are a class of very potent narcotic-analgesics synthesized by the Janssen Pharmaceutical Company of Belgium. Although the chemical structures of these drugs are quite different from the opiates and opioids, the derivatives are pharmacologically and toxicologically similar to the opium-based narcotics such as morphine. Fentanyl, the parent drug, is used extensively in clinical medicine as an intravenous analgesic-anesthetic under the trade name *Sublimaze*. It is a well respected drug.

Beginning in 1979, illicitly synthesized derivatives of fentanyl began appearing on the streets as drugs of abuse under the name of "China White," the name usually associated with the very pure Southeast Asian heroin. Soon thereafter a series of deaths occurred in Southern California which looked like typical heroin overdose deaths, except that toxicological analysis failed to detect any narcotic. Over 100 deaths were reported.

Because of these deaths, through partial support by the California State Department of Alcohol and Drug Programs, a more sensitive analytical method of detection has been developed. The laboratories, using these new methods, have now confirmed the detection of various fentanyl derivatives in body fluids of overdose victims. In addition, they have detected the fentanyls in the urine of a significant number of individuals enrolled in various Methadone and other drug treatment programs throughout California.

They have identified ten different fentanyl derivatives in samples being sold illicitly under a variety of names such as "China White", Synthetic Heroin" and "Fentanyl."



## FENTANYL DERIVATIVES Fentanyl derivatives used in human and veterinary medicine:

- ◆ **Fentanyl** - was introduced into the United States in 1968 as an intravenous analgesic-anesthetic. Fentanyl now occupies a major place in therapeutics as a pre-anesthetic medication. Fentanyl is very potent (approximately 100 times as potent as morphine) and short acting (duration of action is approximately 30 minutes). It is probably used in over 70 percent of all surgeries in the United States
- ◆ **Sufentanyl** - is an extraordinarily potent derivative (2000-4000 times stronger than morphine) used as an anesthetic-analgesic agent for cardiac surgery.
- ◆ **Alfentanyl** - is a very short acting (15 minute), slightly less potent derivative (20 to 30 times stronger than morphine) currently in clinical trials as an ultra-short acting analgesic to be used in diagnostic, dental, minor surgical procedures.
- ◆ **Lofentanyl** - is extremely potent (6000 times stronger than morphine), and very long acting and is being evaluated for use when prolonged analgesia and respiratory depression are required, such as in tetanus and multiple trauma.

### The Illicit Analogs - very little is known about the biological effects.

- ◆ **Alpha-methyl Fentanyl** - was the first illicit fentanyl derivative to appear on the streets. It is a very simple modification of the fentanyl structure, and is about 200 times as potent as morphine.
- ◆ **Benzyl Fentanyl** - has recently appeared mixed with other fentanyl derivatives in street samples. It is possibly an unwanted synthetic by-product, or an intermediate used in the synthesis of other fentanyl derivatives. It has no narcotic effect.
- ◆ **3-Methyl Fentanyl** - is the latest derivative to be introduced onto the streets and it is certainly one of most potent of the fentanyls (3000 times as potent as morphine).

## PHYSICAL DESCRIPTION OF "CHINA WHITE"

The fentanyls are cut (diluted) with large amounts of lactose or sucrose (powdered sugar) before they are sold on the street so the amount of active drug present is exceedingly small, less than 1 percent. These amounts are so small they contribute nothing to the color, odor, or taste of the sample.

**Color** - The color of the street drug has ranged from pure white (sold as Persian White), to light tan (sold as Synthetic Heroin), to a light brown (sold as Mexican Brown). The brown color comes from the lactose which has been heated and has caramelized slightly.

**Texture** - The texture of the street samples has ranged from light and finely powdered to somewhat coarse, cake-like, and crumbly, somewhat resembling powdered milk.

**Odor** - Occasional samples will have a medicinal or chemical odor, but this is not characteristic.

**Packaging** - Samples are sold like heroin. Many times it is found in small zip-lock plastic bags and bindles.

In summary, the fentanyls appear in all the various forms that heroin does, and there is nothing characteristic about the appearance of any sample that will identify it as fentanyl.

## PHARMACOLOGICAL EFFECTS OF FENTANYL

The euphoria or "rush" from the fentanyls is qualitatively similar to that of heroin, and the intensity of the effect would depend upon the dose and the particular derivative used. It should also be remembered that although the fentanyls are chemically quite distinct from other narcotics, they are pharmacologically equivalent.

## DESIGNER DRUGS HALLUCINOGENIC AMPHETAMINES

### HISTORY OF DRUG:

This family of drugs are amphetamine analogues of the psychedelic drug, mescaline (methoxylated phenylethylamine.) This group contains more than a thousand different but related chemical substances. These drugs have a high potential for abuse and have no redeeming therapeutic value. Among those known to us are methylenedioxyamphetamine (MDA) - psychedelic speed and 3,4 methylenedioxyamphetamine (MDMA) - Ecstasy.

The description of these analogues sound like the fulfillment of a psychedelic user's fantasy. Users have reported the onset as a warm glow spreading through their bodies, followed by a sense of physical and mental well being that gradually but steadily intensifies. Some have described a sense of increased coordination and ability to do things they couldn't ordinarily do. Unlike most stimulants, however, these analogues do not increase motor activity, but in fact suppresses it. Thus, consumers can sometimes sit in meditation, or do yoga and related activities, for long periods of time. Some of these analogues have shown through research that they work as an appetite depressant.

Others have reported these analogues produce feelings of aesthetic delight, empathy, serenity, joy, insight, and self-awareness, without perceptual changes, loss of control, or depersonalization; and seems to eliminate anxiety and defensiveness. The user feels himself to be a child and relives childhood experiences in full immediacy, while simultaneously remaining aware of his present self and present reality.



## METHODS OF USE - HALLUCINOGENIC AMPHETAMINES

MDA is usually found in powder form and is sold on the street as the Love Drug or Psychedelic Speed. MDMA is found in tablet, capsule, and powder form. MDMA is sold as ecstasy. XTC, ADAM, essence, cocaine or MDA. The average dose is between 50 and 150 milligrams. The popular way of taking the drug is through oral ingestion. However, some have found injection to get a quicker effect. The duration of a trip is approximately eight to twelve hours. Sometimes the effects of a high dose can last so long, ebbing and returning, that the user may think that they will never end.

As to psychological toxicity - some people can suffer panic reactions or "bad trips", as with other psychedelic drugs. Some users mistake the increased heart rate for a heart attack, thus developing cardiac anxiety, which increases the panic reaction.

The street sales and use of these analogues are promoted through the distribution of pamphlets and circulars entitled "Ecstasy, Everything Looks Wonderful When You're Young and on Drugs", "Flight Instructions for a Friend Using XTC", "Ecstasy", "21st Century Entheogen", "How to Prepare for an Ecstasy Experience", and "Reflections on the Nature and Use of XTC".

## DESIGNER DRUG - GAMMA HYDROXY BUTYRATE (GHB)

### HISTORY OF DRUG:

Gamma Hydroxy Butyrate (GHB) is classified as a depressant and a hypnotic type drug. When GHB is used in conjunction with alcohol or other drugs, detrimental effects occur in increasing numbers. It is difficult to isolate the impact of GHB ingestion since it is so typically taken with an ever-changing array of other drugs.

GHB is an anesthetic (sleep inducer), without analgesic (pain relieving) properties, that is been found naturally occurring in minute quantities in brain and other tissues in the human body.

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**History of Drug GHB** has no nutritional value. Typical side effects from ingested doses include nausea, coma (sometimes abrupt and profound), uncontrollable seizures and respiratory depression. Law enforcement has experienced a presence in driving under the influence, sexual assault cases, and with overdose incidents. GHB is a central nervous system depressant that was originally abused by bodybuilders who believed it would stimulate the body's production of growth hormone.

## METHODS OF USE - "GHB"

GHB, in its pure form, can be found in powder. However, GHB encountered on the street, is illicitly produced and is primarily distributed as a clear liquid. There has been some reporting of a bitter taste associated with the drug. However, in most cases the drug is taken with alcohol and can cover up the taste.

## BAD EFFECTS OF "GHB" USE

The Overdose range for GHB can be as little as 2 grams, based on body weight and individual sensitivity. One major problem with GHB as an underground recreational substance is that it has a sharp dose-response curve. Another major problem is that uninformed users often mix GHB with alcohol, which drastically increases the chance of vomiting and unconsciousness. An overdose can consist of mild to extreme nausea and dizziness, and vomiting. Also a strong drowsy feeling followed by an temporarily unrouseable sleep (coma). Some Overdoses of GHB mix vomiting with unconsciousness which is an extremely dangerous combination for obvious reasons. When using GHB (or any substance), it is important to remember to let someone who is with you know what you're doing, so if you experience Overdose effects, they can react appropriately and let any health professionals who become involved know what substance was involved.

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